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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,284	12/29/2003	Alexandre J. Farcy	Intel 2207/17051	8397

7590 11/16/2007

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EXAMINER	
CHAUHAN, LOREN B	
ART UNIT	PAPER NUMBER
2193	

MAIL DATE	DELIVERY MODE
11/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/748,284	FARCY ET AL.	
	Examiner	Art Unit	
	Loren Chauhan	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-53 are pending for examination.

Claim Objections

2. Claim 4 is objected to because of the following informalities: Examiner notes the use of "mite" acronym in above claim. Use of acronyms in claim language should be explained in plain text. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-7, 16-19, 26-30, 38-39 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (US Pat. No. 6,950,924) in view of Bala (US PG-PUB. No. 20020104075).

5. As per claims 1, 16, 26, 38 and 46, Miller teaches the invention substantially as claimed including a processor comprising:

a processing core (col. 1, line 21) to execute a trace having one or more lines of one or more micro-operations (col. 1, lines 22-30, 37-39).

6. However, Miller does not explicitly teach an optimizer to optimize the trace upon each execution of the trace by the processing core.

7. Bala teaches an optimizer to optimize the trace upon each execution of the trace by the processing core (150, fig. 1; page 3, [0028] lines 6-8).

8. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include an optimizer taught by Bala in Miller's processor so that it will improve the processor's performance by giving responsibility to optimize the trace instructions to optimizer (Bala page 3, [0028] lines 6-8).

9. As per claims 2 and 17, Bala teaches wherein the optimizer is a pipelined optimizer (page 3 [0030]).

10. As per claims 3, 18 and 27, Bala teaches a trace cache to store a trace from said optimizer (130, fig. 1; page 3, [0028 lines 8-11).

11. As per claims 4 and 29, Miller teaches an instruction cache to store static code received from a compiler via a memory (32, 22 fig. 1); a mite to translate the static code

into micro-operations (32, 22, 34; col. 1, lines 37-39); and a fill buffer to build a trace from the micro-operations (20, fig. 2).

12. As per claim 5, Miller teaches a trace queue to store one or more lines of one or more traces from the fill buffer and one or more lines from one or more traces from the trace cache (col. 1, lines 44-47, 50-51, 57-59).

13. As per claims 6, 19 and 28, Miller teaches an allocator to send traces from the trace queue to the processing core (col. 2, lines 1-4; col. 1, lines 20-25, 44-47, 50-51, 57-59); but fails to teach that allocator sends traces to the optimizer.

14. Bala teaches that allocator sends traces to the optimizer (150, fig. 1).

15. As per claims 7, 30 and 39, Miller teaches the processing core is an out of order processing core (col. 1, lines 20-30).

16. Claims 8, 12-15, 20, 24-25, 31, 35-37, 40, 44-45, 47 and 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (US Pat. No. 6,950,924) in view of Bala (US PG-PUB. No. 20020104075) and further in view of Benitez (US Pat. No. 6,189,141).

17. As per claims 8, 20, 31, 40 and 47, Miller and Bala do not explicitly teach the optimizer is to track optimizations executed on a specific trace.

18. Benitez teaches the optimizer is to track optimizations executed on a specific trace (col. 32, lines 3-7).

19. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include tracking trace functionality as taught by Benitez in Miller and Bala's system to provide a continuous recordings of control flow through traces and if the control flow has changed during execution, such that the trace can be removed (Benitez Abstract lines 15-20).

20. As per claim 12, Benitez teaches wherein optimizations includes at least one of a group of optimizations consisting of call return elimination, dead code elimination, dynamic uop fusion, binding, load balancing, move elimination, common sub-expression elimination, constant propagation, redundant load elimination, store forwarding, memory renaming, trace specialization, value specialization, reassociation, and branch promotion (col. 32 *see optimizer 920*).

21. As per claim 13, Benitez teaches wherein the optimizer executes optimizations based on runtime information collected during execution of the trace (col. 3, lines 44-46; col. 32, lines 26-27).

22. As per claims 24-25, 35-36, 44-45 and 51-52, they are similar claims as claims 12-13, therefore; they are rejected for the same reason as per claims 12-13.

23. As per claims 14, 37 and 53, Benitez teaches wherein the runtime information is appended to the trace in the trace cache (col. 34, lines 40-44).

24. As per claim 15, Benitez teaches runtime information buffer to store the runtime information, the runtime information buffer mapped to the trace cache to match the runtime information with the trace (col. 32 *see IR Generator 910*).

25. Claims 9-11, 21-23, 32-34, 41-43, and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (US Pat. No. 6,950,924) in view of Bala (US PG-PUB. No. 20020104075) and further in view of Megiddo (US Pat. No. 6,742,179).

26. As per claim 9, Miller and Bala do not explicitly teach the optimizer is to pack the trace after optimization.

27. Megiddo teaches that the optimizer is to pack the trace (col. 2, lines 21-23).

28. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include packing functionality as taught by Megiddo in Miller and

Bala's system so that it will improve cache utilization and fewer cache misses (Megiddo col. 2, lines 21-23).

29. As per claim 10, Megiddo teaches the optimizer is to pack the trace by optimizing two consecutive lines of a trace simultaneously (col. 2, lines 21-24).

30. As per claim 11, Megiddo teaches the optimizer is to use an alternating offset to determine the two consecutive lines of the trace to optimize together (col. 5, lines 5-30).

31. As per claims 21-23, 32-34, 41-43 and 48-50, they are similar claims to claims 9-11, therefore; they are rejected for the same reason as per claims 9-11 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Loren Chauhan whose telephone number is 571-270-1554. The examiner can normally be reached on Mon.-Thr. 9:30-5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Loren Chauhan
Examiner
Art Unit 2193

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